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## **Institutional Context Factors and Female Students' Choice of Career in Science TVET in Technical Training Institutes in Siaya County, Kenya.**

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### **Abstract**

This study sought to determine the relationship between selected institutional context factors and female students' choice of career in science TVET in Technical Training Institutes in Siaya County, Kenya. The study was guided by Social Cognitive Theory as posited by Bandura (1986) and Holland's Theory of Occupational Choice (1959, revised 2017). The study adopted a descriptive survey design. Reliability was tested using a test-retest method. Cronbach alpha method was also used to test internal reliability. The research instruments were questionnaires for lecturers, female and male students. Piloting was done in the village polytechnics a sample size of 316 female students sampled using census method. Also, 291 male students from a total target population of 1136 determined using Krejcie and Morgan Sample Size Determination (1970) formular. Proportionate sampling technique was used to sample respondents in different strata and TTIs. Tools in the Statistical Package for Social Sciences (SPSS) version 22 were used to analyse data. Frequencies, percentages and means were computed. Inferential statistics, namely; regression coefficients, T-statistics, F-statistics, correlation of coefficients, were derived. The findings were presented in tables. The researcher concluded that there was a strong, negative and statistically significant relationship between institutional context factors and female students' choice of career in science TVET Programmes ( $r=-0.726^{**}$ ;  $p<0.01$ ). The researcher recommended that effective career counselling services should be put in place in all TTIs offering TVET science courses and TTIs should encourage lecturers to seek higher education in pedagogy.

**Key Terms:** context factors, female students' choice, TVET, Technical Training Institutes

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## 1.0 INTRODUCTION

Kenya recognises the role of education and training in contributing to the Gross Domestic Product (GDP) with particular emphasis on TVET (Republic of Kenya, 2003). The subsector has been identified as one that will be able to spur economic development within the next 13 years and help achieve Vision 2030. Recently, Kenya revitalised the TVET subsector to locate herself strategically in the international scene (Republic of Kenya, 2012). In spite of global initiatives by UNESCO to enhance access, equity, retention, quality, completion rates and gender parity in education and training, the Technical, Vocational, and Education Training (TVET) subsector in Kenya continues to experience low enrolment among female students and especially in Science, Technology, Engineering and Mathematics (STEM) based courses leading to the creation of TVET Authority Board of Kenya (GOK, 2016).

A study on subject enrolment in Ethiopia by Stebleton (2007) indicated that the students had an external locus of control and believe that there are numerous external factors, which influence their career choices. Pummel et al. (2008) report that external influences help to shape an individual's career aspiration. According to the Journal of Emerging Trends in Educational Research and Policy Studies-JETERAPS- (2011), a student's subject enrolment is also influenced significantly by support from peers. Gender inequality is pronounced in Africa, where socio-cultural factors contribute to the achievements and attitude differences. In Tanzania, reports indicate that very few females qualified for admission into engineering and science programmes in tertiary institutions even after lowering of cut off points (Bunyi, 2004).

It was reported at a workshop organised by Kenyatta University and the World Bank on gender mainstreaming in public universities in Kenya, that although gender disparities in students' enrolment exist at all levels of tertiary education, they are particularly wide in sciences programs, with special reference to mathematics and technical disciplines. It was also reported that women are concentrated in what is perceived as traditional female social science and education disciplines (Sifuna, 2006). Enrolment in TVET programmes also shows the same trend whereby fewer female students enrol in TVET science programmes. A typical case is that of Siaya County, Kenya.

Kenya's Vision 2030 initiative aims at making the country a fully industrialised middle-income country, providing a high-quality life for all its citizens (GOK, 2017). The realisation of vision 2030 also calls for harnessing of the technological ability of both men and women in the country. However, from the background of the study, it is clear that the choice of careers in TVET science programmes by female students in TTIs is not at par with their male counterparts. It is comparably low. Low number of female students choosing careers in science TVET programmes portends a problem because it implies that more women may remain unemployed. This study purposes to investigate the relationship between selected institutional context factors and female selected institutional context factors and female students' choice of career in science TVET in Technical Training Institutes in Siaya County, Kenya.

## 2.0 LITERATURE REVIEW

It is important to note that Bossman (2014) established that the availability of education resources was an important influence in career choice among University of Cape Coast students. This study did not look at the case

of female students' choice of careers in TVET science courses. In their social cognitive analysis, Lent et al. (2000) argue that there are several contextual supports and barriers to a career choice in institutions of learning. Shoffner et al. (2015) in a qualitative exploration of the STEM career-related outcome expectations of young adolescents found out that performance of a child in STEM influence career choice. Wüst and Leko (2017) found out that due to cultural factors, students had different career preferences in Croatia and Germany. This study did not look at the situation in Kenya.

Most of the TTIs in Kenya have an acute shortage of qualified lecturers. This discourages students from taking such courses, in general (Kiamanesh, 2014). Lecturer style was between the top two considerations when selecting a course. Shortage of qualified lecturers can contribute to the success or failure of the students at the technical and vocational institutions (Babad, & Tayeb, 2003). Therefore, it is necessary to scrutinize the influence of quality of lecturers on female students' career choices in science TVET programmes. Because students cannot ascertain the competence levels of lecturers, lecturers were included as respondents in this study.

Curricular-based issues are another dimension, which may encourage or disadvantage female students from pursuing TVET related fields. TVET curricular is designed in a way that it suits male students' needs, hence grossly neglecting the needs of a female student. For instance, in India, girls undertaking engineering disciplines admitted that they were slightly handicapped due to less physical strength when working in some of the laboratories and workshops (Nguyen, 2000). Therefore, the curricula should be revised and developed in a way that it favours female students. This is a general failure of the engineering curricula to include topics, concepts and ideas from the humanities perspective, which would otherwise make engineering more relevant to society as a whole. Thus, revising the curricula for engineering courses is necessary (Nguyen, 2000). Topics in the areas of ethics and biblical studies could improve professionalism in engineering practices.

A study conducted on factors influencing low female students enrolment in science-based courses in tertiary institutions in Western Province, Kenya, showed that curriculum coverage in tertiary colleges is wanting. The study revealed that students did not seem to have covered the syllabus in the past adequately (Muhonja, 2011).

Wilhelm (2004) avers that the quality of an academic programme can have a tremendous effect on whether a student chooses to enrol in a class because it covers a wide variety of factors. Quality means that the laboratories for this subject are well equipped and qualified teachers teach the subject. Research has found that the majority of students will choose classes based on the quality of learning processes rather than the deciding based on the instructor and/or the ease of the class (Babad, & Tayeb, 2003). In fact, according to Wilhelm (2004), students are four times more likely to choose a class where they have the opportunity to learn a "great deal" of knowledge even if the class requires a lot of readings and assignments. Students want to know how they will be assessed throughout a class, and if aspects like effort and improvement will play a role in that assessment (Ferrer-Caja, & Weiss, 2002). Therefore, classes with set expectations and the ability to meet those expectations are very likely to positively influence a student's choice in enrolling in a course (Curran, & Rosen, 2006).

Nagy et al. (2006) note that high school students are liable to enrol in subjects that will pertain to what they desire to study in college. The potential for career opportunities and advancement is seen to greatly influence secondary schools students. Therefore, students are likely to enrol in a certain subject if it is more

valuable to a future career. According to Wilhelm (2004), when a student enrolls to a subject based on its future career relevance, their aspirations become more predominant, their graduation gets closer, and they tend to start searching for jobs. Research findings have shown that the pattern of students' interaction inside and outside the classroom has significant effects on their interest and achievement in science (Fraser, et al., 1999). It is, therefore, necessary to look into the influence of curriculum-related factors on female students' career choices in science TVET programmes.

A study by Whiteley and Porter (1998), aimed at identifying the impact of school policies and practices on students as well as other influences, which affects individual subject choices and career decisions. It was revealed that interviews conducted with students during their final year at school would provide further insight into perceptions of subject selection and their effect on decisions regarding post-school options and career decisions. There is a need to institutionalise affirmative action in institutions of learning and leadership positions in the world of work. Additionally, there is a need for encouraging female role models and mentors programmes for young females as pointed out by a study done by Udeani and Ejikeme (2011). Abdullahi (2005), Bernard (2002), Chapman (2004), Ballara (2012), Chege (1983), and Sifuna (2006) observed that there is lack of positive policy on the structure for girls' education and patriarchal societies.

Chapman (2004) concurs with Bernard (2002) by observing that the absence of policy to promote education for girls is a hidden obstacle to achieving an academic's gender equality. For example, data collected on attendance, completion and achievement that are not desecrated by sex prohibits the formulation of policies for gender equality. Other policies act as specific barriers to girls' education. For example, policies limit the access and placement of girls in a technical institution (Wolf, & Kainja, 2009).

The classroom environment is a close second to college peer group influence, interns of an overall effect upon students. Interactions between faculty members and other students enhance the transmission of information and play a vital role in the shaping of individual thought. Thus, the characteristics of the teaching force, in terms of gender, qualifications and competency are a major component of the classroom environment (Muhonja, 2011).

Glynn et al. (2011) postulated that individual achievement, behaviour, self-esteem, and feeling of loneliness and alienation, especially women, are often the result of a mismatch between the student and the college environment. The individual learner and the institution must be compatible to produce a successful, supportive relationship. This then leads to the successful career of a student (Ballara, 2012).

### 3.0 RESULTS

#### Influence of institutional Factors on Female Students' Choice of Career in TVET Institutions

##### Frequencies of Institutional Context Factors

The frequencies of institutional context factors, which influence female students' choice of career in TVET institutions are shown in table 1:

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**Table 1: Frequencies of Institutional Context Factors reported by Female Students**

Statement	N	SD	D	A	SA
students chose careers in TVET because my TTI gives them career counselling	435	20.7%	52.2%	27.1%	0.0%
students chose careers in TVET because my TTI has well-trained tutors	435	10.6%	38.6%	50.8%	0.0%
Students choose careers in TVET because my TTI has enough relevant books	435	14.7%	63.0%	22.3%	0.0%
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	435	12.6%	13.8%	36.3%	37.2%
My TTI has spacious workshops	435	12.6%	63.2%	22.5%	1.6%
My TTI has enough laboratories	435	7.6%	9.0%	31.3%	52.2%
My TTI has enough lecture halls	435	5.3%	41.8%	14.7%	38.2%
TTI Principal approves of students' choice of career in science TVET programmes	435	6.9%	14.7%	25.3%	53.1%
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	435	3.9%	10.3%	34.3%	51.5%
Students motivated one another to choose careers in science TVET programmes during registration	435	4.1%	11.5%	33.3%	51.0%
Classroom environment influences female students from choosing careers in science TVET programmes	435	5.3%	9.7%	31.7%	53.3%
Curriculum design favours male students but not female students regarding a career choice in science TVET programmes	435	5.3%	12.0%	32.2%	50.6%
Female students attain the entry requirement for pursuing the TVET courses they choose	435	9.4%	9.4%	41.4%	39.8%
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	435	5.7%	11.3%	58.9%	24.1%

Table 1 shows that female students disagree that they chose careers in TVET because their respective TTIs provide career counselling (72.9% disagree and strongly disagree). It means that career counselling is largely lacking in TTIS. According to Gupta (2017), career counselling is crucial in career choice. This could explain why many female students make no choose careers in TVET. Students chose careers in TVET because the TTI has well-trained tutors (49.2% disagree and strongly disagree). This is because they are not able to tell whether tutors are well trained prior to choosing a particular TTI. However, some female students noted that they choose careers in TVET because the TTI is well known for quality training in TVET programmes (73.5 agree and strongly agree). It implies that the choice of a career in a given TTI is based on its reputation. That sits well with the 50.8per cent



who chose careers in TVET because a TTI has well-trained tutors. Quality of lecturers has been established to influence the choice of a course in a specific institution (Kusumawati, 2013).

Female students (63.2%) disagree that they choose careers in TVET because their respective TTIs have enough relevant books. This is because they are not able to tell whether books are available prior to choosing a particular TTI. However, the quality or availability of books has been established to influence the choice of a career in a specific institute (Bhardwa, 2017). About 63.2 per cent of the respondents disagreed that female students choose careers in TVET because their respective TTIs have spacious workshops. Another 41.8 per cent also disagreed that female students choose careers in TVET because the TTI has lecture halls. This is because either lecture halls or workshops are not available or they are not able to tell whether lecture halls or workshops are available prior to choosing a particular TTI. Both cases do not auger well for a career choice in TVET.

This confirms the report by Obwoge and Kibor (2016) that good workshops and lecture halls influence choice of career and quality of career training. Eicker et al. (2017) corroborate this finding by noting that if there are no good lecture halls and workshops, few students are likely to enrol in TVET programmes. Up to 83.5 per cent agreed that female students choose careers in TVET because their respective TTIs have enough laboratories. That TTI principal gives approval of students' choice of career in science TVET programmes was agreed to by 78.4 per cent of the female students. This makes factual sense because principals are the ones who sign admission letters. In concurrence, Gioiosa (2017) observes that college principals have an influence over what students choose as careers.

Female students (85.8%) agreed or strongly agreed that lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration. Many lecturers are involved in registration exercises for college students (Gioiosa, 2017). Similarly, students noted that they motivate one another to choose careers in science TVET programmes during registration. According to Mtemeri (2017), peer influence plays an important role in career choice. Classroom environment influences female students' choice of careers in science TVET programmes (85% agreed or strongly agreed). Hannah (2013) confirms that Classroom environment influences success in career training. About 83 per cent of female respondents reported that curriculum design favours male students but not female students concerning a career choice in science TVET programmes. A similar observation by Chikunda (2017) confirms that curriculum design should be sensitive to gender concerns. Therefore, gender biases in curriculum design could explain why fewer female students chose careers in science TVET.

Female students attain the entry requirements for pursuing chosen TVET courses (81.2% agreed or strongly disagreed). Ministry of Education in Kenya permits students to train in chosen careers only if they attain stipulated entry requirements (KUCCPS, 2014). It implies that those who do not enrol in the programmes may not be qualified: which could be another plausible explanation for fewer female students choosing careers in TVET.

#### **Frequencies of Institutional Context Factors (Lecturers and Students Combined).**

The frequencies in percentages of Institutional Context Factors as reported by both lecturers and female students are recorded in table 2:

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**Table 2: Frequencies of Institutional Context Factors (Lecturers and Female Students, N=555)**

Statement	SD	D	A	SA
students chose careers in TVET because my TTI gives them career counselling	18.7%	51.5%	29.4%	0.4%
students chose careers in TVET because my TTI has well-trained tutors	9.7%	42.2%	48.1%	0.0%
Students choose careers in TVET because my TTI has enough relevant books	15.3%	61.4%	22.7%	0.5%
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	11.2%	16.0%	36.6%	36.2%
My TTI has spacious workshops	12.6%	62.2%	23.6%	1.6%
My TTI has enough laboratories	7.9%	19.1%	31.9%	41.1%
My TTI has enough lecture halls	5.9%	51.5%	11.7%	30.8%
TTI Principal gives approval of students' choice of career in science TVET programmes	7.2%	24.1%	26.7%	42.0%
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	6.3%	20.4%	33.0%	40.4%
Students motivated one another to choose careers in science TVET programmes during registration	5.0%	20.2%	34.2%	40.5%
Classroom environment influences female students from choosing careers in science TVET programmes	7.6%	12.8%	31.4%	48.3%
Curriculum design favours male students but not female students in regard to a career choice in science TVET programmes	7.9%	20.9%	31.5%	39.6%
Female students attain the entry requirement for pursuing the TVET courses they choose	8.6%	11.7%	39.1%	40.5%
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	5.8%	16.2%	52.3%	25.8%

In table 2 findings, lecturers confirm what female students perceive as the institutional context factors that influence the choice of careers in TVET for the latter.

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### Descriptive Statistics by Institute

The frequencies of institutional context factors by the institute are shown in table 3:

**Table 3: Frequencies of Institutional Context factors in S TTI**

Statement	SD	D	A	SA
students chose careers in TVET because my TTI gives them career counselling	21.5%	56.5%	22.0%	0.0%
students chose careers in TVET because my TTI has well-trained tutors	15.3%	56.5%	28.2%	0.0%
Students choose careers in TVET because my TTI has enough relevant books	23.7%	56.5%	18.6%	1.1%
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	18.6%	28.8%	20.9%	31.6%
My TTI has spacious workshops	21.5%	59.3%	18.1%	1.1%
My TTI has enough laboratories	9.6%	21.5%	32.8%	36.2%
My TTI has enough lecture halls	6.8%	60.5%	6.8%	26.0%
TTI Principal gives approval of students' choice of career in science TVET programmes	11.3%	24.9%	22.0%	41.8%
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	5.1%	27.1%	29.4%	38.4%
Students motivated one another to choose careers in science TVET programmes during registration	6.2%	21.5%	35.0%	37.3%
Classroom environment influences female students from choosing careers in science TVET programmes	9.6%	14.7%	24.9%	50.8%
Curriculum design favours male students but not female students in regard to a career choice in science TVET programmes	11.3%	22.0%	26.6%	40.1%
Female students attain the entry requirement for pursuing the TVET courses they choose	6.8%	18.6%	34.5%	40.1%
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	6.8%	16.4%	53.1%	23.7%

Table 3 shows that female students of S TTI disagreed that they chose careers in TVET because the TTI provide career counselling (78% disagree and strongly disagree). It means that career counselling is largely lacking in the TTI. According to Gupta (2017), career counselling is crucial in career choice. This could explain why few female students in the TTI choose careers in TVET. Students chose careers in TVET because the S TTI has well-trained tutors (71.9% disagree and strongly disagree). This is because they are not able to tell whether tutors are well trained prior to choosing a particular TTI. However, some female students noted that they choose careers in TVET because the TTI is well known for quality training in TVET programmes (only 51.5% agreed and strongly



agreed). This confirms the view that the quality of lecturers influences the choice of a course in a specific institution (Kusumawati, 2013).

Female students (80.2%) disagree that they choose careers in TVET because their respective TTIs have enough relevant books. It implies that books could be lacking in that TTI. Quality and availability of books have been established to influence the choice of a career in a specific institute (Bhardwa, 2017). About 80.8 per cent of the respondents disagreed that female students choose careers in TVET because the TTI has spacious workshops. Another 67.3 per cent of female students disagreed that female students choose careers in TVET because the TTI has lecture halls. This is because either lecture halls or workshops are not available or they are not able to tell whether lecture halls or workshops are available prior to choosing a particular TTI. Both cases do not auger well for a career choice in TVET.

Similarly, Oweikeye (2014) reported that good workshops and lecture halls influence choice of career and quality of career training. If there are no good lecture halls and workshops, few students are likely to enrol in TVET programmes (Kigwilu, 2014). Up to 69 per cent agreed that female students choose careers in TVET because the TTI has enough laboratories. That the TTI principal gives approval of students' choice of career in science TVET programmes were agreed to by 63.8 per cent of the female students. This makes factual sense because principals are the ones who sign admission letters. College principals have an influence on what students choose as careers (Gioiosa, 2017).

Female students (68.3%) agreed or strongly agreed that lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration. Many lecturers are involved in registration exercises for college students. Similarly, 62.3% of students disagreed that they motivate one another to choose careers in science TVET programmes during registration. Absence of peer motivation could explain why there are fewer female students choosing careers in TVET science programmes. Accordingly, Naz et al. (2014) note that peer influence plays an important role in career choice.

Classroom environment influences female students' choice of careers in science TVET programmes (75.7% agreed or strongly agreed). Hannah (2013), who notes that the classroom environment influences success in career training, confirms this. Only 66.7 per cent of female respondents reported that curriculum design favours male students but not female students about a career choice in science TVET programmes. According to Mutendwahothe and Sipho (2010), the curriculum design should be sensitive to gender concerns. Gender biases in curriculum design could explain why fewer female students chose careers in science TVET.

Female students attain the entry requirements for pursuing chosen TVET courses (74.6% agreed or strongly disagreed). Ministry of Education (2012) in Kenya permits students to train in chosen careers only if they attain stipulated entry requirements. It implies that those who do not enrol in the programmes may not be qualified: which could be another plausible explanation for fewer female students choosing careers in TVET. The TTI has enough explanations why fewer female students chose careers in TVET.

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### Descriptive statistics by Institute

The frequencies of institutional context factors for B TTI are presented in table 4:

**Table 4: Frequencies of Institutional Context Factors in B TTI**

Statement	SD	D	A	SA
students chose careers in TVET because my TTI gives them career counselling	29.8%	51.1%	18.4%	0.7%
students chose careers in TVET because my TTI has well-trained tutors	17.7%	47.5%	34.8%	0.0%
Students choose careers in TVET because my TTI has enough relevant books	20.6%	55.3%	23.4%	0.7%
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	19.1%	17.7%	31.2%	31.9%
My TTI has spacious workshops	17.0%	53.2%	28.4%	1.4%
My TTI has enough laboratories	7.8%	17.7%	35.5%	39.0%
My TTI has enough lecture halls	5.0%	54.6%	14.9%	25.5%
TTI Principal gives approval of students' choice of career in science TVET programmes	5.0%	27.7%	27.0%	40.4%
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	6.4%	22.0%	34.8%	36.9%
Students motivated one another to choose careers in science TVET programmes during registration	5.0%	22.0%	33.3%	39.7%
Classroom environment influences female students from choosing careers in science TVET programmes	9.9%	12.8%	29.8%	47.5%
Curriculum design favours male students but not female students in regard to a career choice in science TVET programmes	5.7%	22.7%	26.2%	45.4%
Female students attain the entry requirement for pursuing the TVET courses they choose	11.3%	5.7%	42.6%	40.4%
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	5.0%	20.6%	44.7%	29.8%

Table 4 shows that female students of B TTI disagreed that they chose careers in TVET because the TTI provide career counselling (80.9 % disagree and strongly disagree). It means that career counselling is largely lacking in the TTI. According to Gobel (2014), career counselling is crucial in career choice. This could explain why few female students in the TTI choose careers in TVET. Students chose careers in TVET because the S TTI has well-trained tutors (65.2% disagree and strongly disagree). This is because they are not able to tell whether tutors are well trained prior to choosing a particular TTI. However, some female students noted that they choose careers in TVET because the TTI is well known for quality training in TVET programmes (only 63.1% agreed and strongly

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agreed). Contrarily, it has been documented that the quality of lecturers has been established to influence the choice of a course in a specific institution (Jasch, 2013). This could explain why there are fewer female students choosing careers in TVET science programmes.

Female students (76.1%) disagree that they choose careers in TVET because their respective TTIs have enough relevant books. It implies that books could be lacking in that TTI. Quality or availability of books has been established to influence the choice of a career in a specific institute (Ferry, 2006). About 70.2 per cent of the respondents disagreed that female students choose careers in TVET because the TTI has spacious workshops. Only 59.6 per cent of female students disagreed that female students choose careers in TVET because the TTI has lecture halls. This is because either lecture halls or workshops are not available or they are not able to tell whether lecture halls or workshops are available prior to choosing a particular TTI. Both cases does not auger well for a career choice in TVET. This is because Oweikeye (2014) reported that good workshops and lecture halls influence choice of career and quality of career training. If there are no good lecture halls and workshops, few students are likely to enrol in TVET programmes (Kigwilu, 2014). Up to 74.5 per cent agreed that female students choose careers in TVET because the TTI has enough laboratories. That the TTI principal gives approval of students' choice of career in science TVET programmes were agreed to by 67.4 per cent of the female students. This makes factual sense because principals are the ones who sign admission letters. College principals have an influence on what students choose as careers (Gioiosa, 2017).

Female students (71.7%) agreed or strongly agreed that lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration. Many lecturers are involved in registration exercises for college students. Similarly, 70.2% of students disagreed that they motivate one another to choose careers in science TVET programmes during registration. However, according to (Naz, et al., 2014), peer influence plays an important role in career choice. Classroom environment influences female students' choice of careers in science TVET programmes (67.3% agreed or strongly agreed). Classroom environment influences success in career training (Hannah, 2013). Only 71.6% of female respondents reported that curriculum design favours male students but not female students concerning a career choice in science TVET programmes. Curriculum design should be sensitive to gender concerns (Mutendwahothe, & Siphon, 2010). Gender biases in curriculum design could explain why fewer female students chose careers in science TVET.

Female students attain the entry requirements for pursuing chosen TVET courses (83% agreed or strongly disagreed). Ministry of Education (2012) in Kenya permits students to train in chosen careers only if they attain stipulated entry requirements. It implies that those who do not enrol in the programmes may not be qualified: which could be another plausible explanation for fewer female students choosing careers in TVET. The TTI has enough explanations why fewer female students chose careers in TVET.

It is noteworthy that the statistics for B TTI are more favourable than those of S TTI. Additionally, it is important to note that female students choosing careers in Y TTI are more than the ones in S TTI. It can be concluded that institutional context factors should be improved to raise the number of female students choosing careers in TTIs.

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### Descriptive statistics by Institute

The frequencies of institutional context factors for Z TTI are shown in table 5:

**Table 5: Frequencies of Institutional Context Factors in Z TTI**

Statement	SD	D	A	SA
students chose careers in TVET because my TTI gives them career counselling	10.1%	48.1%	41.4%	0.4%
students chose careers in TVET because my TTI has well-trained tutors	0.8%	28.3%	70.9%	0.0%
Students choose careers in TVET because my TTI has enough relevant books	5.9%	68.8%	25.3%	0.0%
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	0.8%	5.5%	51.5%	42.2%
My TTI has spacious workshops	3.4%	69.6%	24.9%	2.1%
My TTI has enough laboratories	6.8%	18.1%	29.1%	46.0%
My TTI has enough lecture halls	5.9%	43.0%	13.5%	37.6%
TTI Principal gives approval of students' choice of career in science TVET programmes	5.5%	21.5%	30.0%	43.0%
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	7.2%	14.3%	34.6%	43.9%
Students motivated one another to choose careers in science TVET programmes during registration	4.2%	18.1%	34.2%	43.5%
Classroom environment influences female students from choosing careers in science TVET programmes	4.6%	11.4%	37.1%	46.8%
Curriculum design favours male students but not female students in regard to a career choice in science TVET programmes	6.8%	19.0%	38.4%	35.9%
Female students attain the entry requirement for pursuing the TVET courses they choose	8.4%	10.1%	40.5%	40.9%
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	5.5%	13.5%	56.1%	24.9%

Table 5 shows that only 48.1 per cent female students of N TTI disagreed that they chose careers in TVET because the TTI provide career counselling. In fact, 41.4% agree that they chose careers in TVET because the TTI provide career counselling. According to Gupta (2017), career counselling is crucial in career choice. This could explain why more female students in the TTI choose careers in TVET. Quality of lecturers has been established to influence the choice of a course in a specific institution (Kusumawati, 2013). Students choose careers in TVET because N TTI has well-trained tutors (70.9% agree). Female students noted that they choose careers in TVET because N TTI is well known for quality training in TVET programmes (only 93.7% agreed and strongly agreed).

Female students (68.8%) disagree that they choose careers in TVET because their respective TTIs have enough relevant books. It implies that books could be lacking in that TTI. Quality or availability of books has been established to influence the choice of a career in a specific institute (Bhardwa, 2017). About 69.9% of the respondents disagreed that female students choose careers in TVET because the TTI has spacious workshops. About 51.1% of female students agreed that female students choose careers in TVET because the TTI has lecture halls. This is because either lecture halls or workshops are not available or they are not able to tell whether lecture halls or workshops are available prior to choosing a particular TTI. Both cases does not auger well for a career choice in TVET. This is because Oweikeye (2014) reported that good workshops and lecture halls influence choice of career and quality of career training. If there are no good lecture halls and workshops, few students are likely to enrol in TVET programmes (Eicker, et al., (2017). Up to 75.1 per cent agreed that female students choose careers in TVET because the TTI has enough laboratories. That the TTI principal gives approval of students' choice of career in science TVET programmes was agreed to by 73 per cent of the female students. This makes factual sense because principals are the ones who sign admission letters. College principals have an influence over what students choose as careers (Mohd, et al., 2010)

Female students (78.5%) agreed or strongly agreed that lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration. Many lecturers are involved in registration exercises for college students (Gioiosa, 2017). Similarly, 77.7 per cent of students agreed that they motivate one another to choose careers in science TVET programmes during registration. However, according to Mtemeri (2017), peer influence plays an important role in career choice. Classroom environment influences female students' choice of careers in science TVET programmes (83.6% agreed or strongly agreed). Classroom environment influences success in career training (Thomas, 2017). Only 74.3 per cent of female respondents reported that curriculum design favours male students but not female students about a career choice in science TVET programmes. Curriculum design should be sensitive to gender concerns (Mutendwahothe, & Siphon, 2010). Gender biases in curriculum design could explain why fewer female students chose careers in science TVET.

Female students attain the entry requirements for pursuing chosen TVET courses (81.4% agreed or strongly disagree). Ministry of Education (2012) in Kenya permits students to train in chosen careers only if they attain stipulated entry requirements. It implies that those who do not enrol in the programmes may not be qualified: which could be another plausible explanation for fewer female students choosing careers in TVET. N TTI has enough explanations why fewer female students chose careers in TVET.

It is noteworthy that the statistics for N TTI are more favourable than those of B TTI. Furthermore, it is important to note that female students choosing careers in N TTI are more than the ones in B TTI. It can be concluded that institutional context factors should be improved to raise the number of female students choosing careers in TTIs



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### Means of Institutional Context Factors Reported according to Female Students.

The means of institutional context factors reported by female students are shown in table 6:

**Table 6: Means of Institutional Context Factors reported by female students**

Statement	N	Mean	SD
Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	435	3.01	0.76
Female students attain the entry requirement for pursuing the TVET courses they choose	435	3.11	0.93
Curriculum design favours male students but not female students in regard to a career choice in science TVET programmes	435	3.28	0.87
Classroom environment influences female students from choosing careers in science TVET programmes	435	3.33	0.86
Students motivated one another to choose careers in science TVET programmes during registration	435	3.31	0.83
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	435	3.33	0.82
TTI Principal gives approval of students' choice of career in science TVET programmes	435	3.25	0.95
My TTI has enough lecture halls	435	2.86	0.99
My TTI has enough laboratories	435	3.28	0.92
My TTI has spacious workshops	435	2.13	0.63
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	435	2.98	1.00
Students choose careers in TVET because my TTI has enough relevant books	435	2.08	0.60
students chose careers in TVET because my TTI has well-trained tutors	435	2.40	0.67
students chose careers in TVET because my TTI gives them career counselling	435	2.06	0.69
Institution Context Factors Overall Index	435	2.89	0.41

Table 6 shows that respondents agreed that institutional context factors influence female students' choice of careers in TVET. The respondents, however, disagreed that students chose careers in TVET because their respective TTI gave them career counselling, had well-trained tutors or had enough relevant books.

### Means of Institutional Context Factors Reported according to Female Students and Lecturers.

The institutional context factors reported by female students and lecturers are shown in table 7:

**Table 7: Means of Institutional Context Factors reported by female students and lecturers**

Statement	N	Mean	SD
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Teaching methods used in TVET programmes influence female students' career choice in science TVET programmes	555	2.98	0.81
Female students attain the entry requirement for pursuing the TVET courses they choose	555	3.12	0.93
Curriculum design favours male students but not female students in regard to a career choice in science TVET programmes	555	3.03	0.96
Classroom environment discourage female students from choosing careers in science TVET programmes	555	3.20	0.93
Students motivated one another to choose careers in science TVET programmes during registration	555	3.10	0.89
Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration	555	3.07	0.92
TTI Principal gives approval of students' choice of career in science TVET programmes	555	3.03	0.97
My TTI has enough lecture halls	555	2.67	0.98
My TTI has enough laboratories	555	3.06	0.96
My TTI has spacious workshops	555	2.14	0.64
Students choose careers in TVET because my TTI is well known for quality training in TVET programmes	555	2.98	0.99
Students choose careers in TVET because my TTI has enough relevant books	555	2.08	0.63
students chose careers in TVET because my TTI has well-trained tutors	555	2.38	0.66
students chose careers in TVET because my TTI gives them career counselling	555	2.11	0.70
Institutional Context Factors Overall Index	555	2.78	0.43
Valid N (listwise)	555		

Table 7 shows that respondents largely agreed that institutional context factors influence female students' choice of careers in TVET. The respondents, however, disagreed that students chose careers in TVET because their respective TTIs gave them career counselling ( $M=2.11$ ), had well-trained tutors ( $M=2.38$ ) or had enough relevant books ( $M=2.08$ ). The absence of these services and resources could explain why few female students chose careers in TVET.

### The difference in Perception of Institutional Context Factors by Institute

ANOVA test was conducted to determine whether there existed a significant difference in perception female students of Institutional Context factors among S, B and N Technical Training Institutes at 0.05 alpha levels. Table 8 illustrates the finding of the analysis.

**Table 8: Difference in Perception of Institutional Context factors by Females respondents by Institute.**

	Sum of Squares	Df	Mean Square	F	Sig.
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Between Groups	3.345	2	1.673	10.518	.000
Within Groups	68.697	432	.159		
Total	72.042	434			

The finding showed that there exists a statistically significant difference in perception of Institutional Context factors across S, Band N Technical Training Institutes by female respondents at the 0.05 alpha level,  $F(2, 432) = 10.518$ ,  $p < 0.05$ .

### Multiple Comparisons of Institutional Context Factors among the TTIs

A post hoc test using Tukey tests were carried out for the three pairs of groups. The Tukey post hoc test is generally the preferred test for conducting post hoc tests on a one-way ANOVA (Allen, 2017). The findings are shown in Table 9.

**Table 9: Multiple Comparisons of Institutional Context Factors among the TTIs**

Paired Group	Mean Difference (I-J)	Std. Error	Sig.
N TTI – S TTI	-0.19264*	.045	.000
B TTI – S TTI	-0.14892*	.048	.006
B TTI- TTI	.04372	.052	.676

\*. The mean difference is significant at the 0.05 level.

The study shows that there was a significant difference between S TTI and N TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ( $p < 0.05$ ) in favour of N TTI.

Further, Table 9 it shows that there was a significant difference between B TTI and N TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ( $p < 0.05$ ) in favour of N TTI. There was no significant difference between B TTI and S TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ( $p$  is greater than 0.05) in favour of N TTI. That could explain why N TTI has more female students choosing careers in TVET.

### Institutional Factors that influence Female Students' Choice of Career in TVET Institutions.

This study purposes to find out the influence of institutional factors on female students' choice of careers in TVET institutions. The leadership of various Institutes give student sample time to change courses, sometimes up to two weeks. The same policy is also with the universities. In some cases interfaculty transfer allowed during an academic year if the student is ready to pay and start afresh. Students, therefore, have time to experience some intuitional factors during which time they are able to make up their minds to continue or to choose new careers.

Many female students disagree that they chose careers in TVET because their respective TTIs provide career counselling (72.9% disagree and strongly disagree). It means that career counselling is largely lacking in

TTIS. Students chose careers in TVET because the TTIs have well-trained tutors (49.2% disagree and strongly disagree). This is because they are not able to tell whether tutors are well trained prior to choosing a particular TTI. However, some female students noted that they choose careers in TVET because the TTI is well known for quality training in TVET programmes (73.5 agree and strongly agree). It implies that the choice of a career in a given TTI is based on its reputation. That sits well with the 50.8% who chose careers in TVET because a TTI has well-trained tutors.

Female students (63.2%) disagree that they choose careers in TVET because their respective TTIs have enough relevant books. This is because they are not able to tell whether books are available prior to choosing a particular TTI. However, even when they join the 63.2% disagree that they choose careers in TVET because their respective TTIs have enough relevant books. About 63.2% of the respondents disagreed that female students choose careers in TVET because their respective TTIs have spacious workshops. Another 41.8% also disagreed that female students choose careers in TVET because the TTI has lecture halls. This is because either lecture halls or workshops are not available or they are not able to tell whether lecture halls or workshops are available prior to choosing a particular TTI. Both cases do not auger well for a career choice in TVET. If there are no good lecture halls and workshops, few students are likely to enrol in TVET programmes. Up to 83.5% agreed that female students choose careers in TVET because their respective TTIs have enough laboratories. That TTI principals give approval of students' choice of career in science TVET programmes was agreed to by 78.4 per cent of the female students. This makes factual sense because principals are the ones who sign admission letters. Additionally, 85.8% of female students agreed and strongly agreed that lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration. Many lecturers are involved in registration exercises for college students. Similarly, students noted that they motivate one another to choose careers in science TVET programmes during registration.

Classroom environment influences female students' choice of careers in science TVET programmes (85% agreed or strongly agreed). About 83% of female respondents reported that curriculum design favours male students and not female students in regard to a career choice in science TVET programmes. Gender biases in curriculum design could explain why fewer female students chose careers in science TVET. Female students attain the entry requirements for pursuing chosen TVET courses (81.2% agreed or strongly disagree). It implies that those who do not enrol in the programmes may not be qualified: which could be another plausible explanation for fewer female students choosing careers in TVET. Respondents agreed that institutional context factors influence female students' choice of careers in TVET. The respondents, however, disagreed that students chose careers in TVET because their respective TTI gave them career counselling, had well-trained tutors or had enough relevant books.

The finding showed that there exists a statistically significant difference in perception of Institutional Context factors across X, Y and Z Technical Training Institutes by female respondents at the 0.05 alpha level,  $F(2, 432) = 10.518$ ,  $p < 0.05$ . The study shows that there was a significant difference between X TTI and Z TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ( $p < 0.05$ ) in favour of Z TTI.

There was a significant difference between Y TTI and Z TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ( $p < 0.05$ ) in favour of Z TTI. There was no significant difference between Y TTI and X TTI in terms of how female respondents perceive the influence of institutional context factors on female students' career choice in TVET ( $p$  is greater than 0.05) in favour of Z TTI. That could explain why Z TTI has more female students choosing careers in TVET. The finding revealed that there was a statistically significant difference between female students and lecturers concerning their perception of the influence of Institutional context factors on female students' career choice at 0.05,  $t(553) = 14.787$ ,  $p < 0.05$ ). Further, the finding also showed that there exists a statistically significant difference in perception of Institutional Context factors across X, Y and Z Technical Training Institutes at the 0.05 alpha level,  $F(2, 552) = 17.790$ ,  $p < 0.05$ .

As a whole, factors influencing the choice of careers by students include: instructional methods, attainment of entry requirement for pursuing TVET courses, curriculum design favouring male students and not female students, Lecturers of TVET courses motivated students to choose careers in science TVET programmes during registration, classroom environment, students motivate one another to choose careers in science TVET programmes during registration, availability of lecture halls, laboratories, spacious workshops, quality training in TVET programmes, enough relevant books, well-trained tutors, and career counselling.

$H_{04}$ : There is no statistically significant influence of institutional factors on female students' choice of careers in TVET science programmes in Technical Training Institutes in Siaya County, Kenya. The null hypothesis was rejected.

#### **Correlation between institutional context Factors and Female Students' Choice of Career in TVET**

Table 10 presents correlation between Institutional Context Factors and female students' choice of careers in TVET as reported by female students and lecturers.

**Table 10: Correlation between Institutional Context Factors and Female Students' Choice of Careers**

		Institutional Context Factors
Female Students' Career Choice In Science TVET programmes	Pearson Correlation Coefficient	-.511**
	Sig. (2-tailed)	.000
	N	555

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

The findings in Table 10 revealed that there exists a negative and statistically significant relationship between institutional context factors and female students' career choice in science TVET Programmes ( $r = -0.511^{**}$ ;  $p < 0.01$ ). This implies that the persistent lack of institutional context factors such as classroom environment, lecture halls, nature of workshops and laboratories could cause fewer female students to choose careers in



science TVET programmes. According to Gaotlhobogwe (2012), lack of instructional resources can discourage students from choosing careers in science courses.

#### **Correlation between Institutional Context Factors and Female Students' Choice of Careers in TVET**

Table 11 presents correlation between Institutional Context Factors and female students' choice of careers in TVET as reported by female students.

**Table 11: Correlation between Institutional Context Factors and Female Students' Choice of Career**

		Institutional Context Factors
Female Students' Career Choice In Science TVET programmes	Pearson Correlation Coefficient	-.726**
	Sig. (2-tailed)	.000
	N	435

**\*\*.** Correlation is significant at the 0.01 level (2-tailed).

Table 11 shows the existence of strong, negative and statistically significant relationship between institutional context factors and female students' choice of career in science TVET Programmes ( $r = -0.726^{**}$ ;  $p < 0.01$ ). This implies that the persistent lack of institutional context factors such as classroom environment, lecture halls, nature of workshops and laboratories could cause fewer female students to choose careers in science TVET programmes. This finding corroborates that of Gaotlhobogwe (2012) who noted that lack of instructional resources can discourage students from choosing careers in science courses.

## **4.0 CONCLUSION AND RECOMMENDATIONS**

**Conclusions:** Therefore, institutional context factors have a significant influence on female students' choice of careers in TVET science programmes in Technical Training Institutes in Siaya County, Kenya. Such factors are instructional methods, attainment of entry requirement for pursuing TVET courses, curriculum design favouring male students and not female students, Lecturers of TVET courses motivating students to choose careers in science TVET programmes during registration, conducive classroom environment, students motivating one another to choose careers in science TVET programmes during registration, availability of lecture halls, laboratories, spacious workshops, quality training in TVET programmes, enough relevant books, well-trained tutors, and career counselling.

**Recommendations:** Effective career counselling services should be put in place in all TTIs offering TVET science courses, TTIs should encourage lecturers to seek higher education in pedagogy, spacious workshops, more relevant books, lecture halls should be provided in the TTIs and classroom environment with curricular designs should be improved.

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